An Evolutionary Basis for Synesthesia: Unexpected Sounds Ramp Up Sensitivity of Touch Perception as Evidenced by Phantom Itch Sensations

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Introduction

In an altered mental state, human beings (and in theory, other animals) are capable of experiencing the neurological aberration of mistakenly interpreting sensory inputs of one type as that of another.

Abstract

The fact that comparatively modest chemical influences can bring about this effect suggests that the human brain may be hard-wired to facilitate synesthesia under certain circumstances and that this capability bestowed upon human ancestors an increased likelihood of survival.

The abrupt introduction of an unexpected audible input may be, even outside of an altered mental state, interpreted as the sensation of itching at the moment of a spike in sensory sensitivity. This phantom itch sensation is the hallmark of the effect and is accompanied by increased sensitivity to touch.

This sort of effect would have tangible survival benefits in the specific case of an insect such as a mosquito landing upon an animal undetected and taking some short period of time before choosing to bite the animal. If the insect beats its wings while perched upon the skin of an animal, the animal could hear this and would have an opportunity to shoo away the insect.

Stimuli such as the legs of an insect, if they are not moving, are progressively less likely to be noticed after prolonged contact with the skin. However, this prolonged contact can cause an accumulation of chemical precursors associated with the itch sensation over a period of seconds. Ordinarily, these precursors would not accumulate in substantial enough quantities for itch to be perceived. However, if the brain's sensitivity to itch were temporarily escalated by a form of synesthesia in which specific types of sounds, sc. the buzzing of an insect's wings are, in fact, perceived as phantom itch, that phantom itch would be perceived as coming from the area of the dermis with the greatest concentration of these precursor chemicals rather than an arbitrary location.

The perception by an animal of a phantom itch sensation does little to encumber survival, even if there are hundreds of "false alarms" for every actual instance of an insect landing upon the animal. When one considers that insects can carry diseases such a malaria, the ability to sense when an insect has landed on the skin would have tangible survival benefits.

Conclusion

It may be reasonable to conclude that if synesthesia is an evolved neurological capacity and that malaria has historically only affected humans (humans being one a handful of (mostly) hairless species that might experience an insect landing directly on the dermis) that other animal species likely do not experience synesthesia. In order for there to be a benefit to survival, the species in question would both need to be vulnerable to malarial illness and would need to have bare skin for an insect to land upon in order for touch or itch to be perceived.